

CLAIMS

1. An optical disk drive comprising:

an optical pickup for emitting a laser to an optical disk as a recording medium, and signal-processing a reflected light from the optical disk;

a servo error signal generation means for generating a servo error signal of a focusing and tracking servo system from the reflected light;

an offset detection means for detecting an offset which occurs in the servo error signal due to defocusing or detracking of an objective lens in the optical pickup, and obtaining an offset adjustment value for canceling the offset;

an offset adjustment means for adding the offset adjustment value to the servo system to cancel the offset of the servo system which is detected by the offset detection means;

a gain adjustment means for adjusting the gain of the servo system;

a laser power switching means for changing the power of the laser emitted from the optical pickup;

a command means for outputting an offset adjustment command, a gain adjustment command, and a laser power switching command to the offset adjustment means, the gain adjustment means, and the laser power adjustment means, respectively;

a storage means for holding an offset adjustment value, a

gain adjustment value, and a laser power, which are to be set in the offset adjustment means, the gain adjustment means, and the laser power adjustment means, respectively; and

a driving means for receiving the servo error signal, and outputting a driving signal for controlling the optical pickup;

wherein a first gain adjustment value and a first offset adjustment value to be set in the servo system are stored in the storage means, when the laser power emitted from the optical pickup is a first laser power;

said optical disk drive being characterized by that a second gain adjustment value to be set in the servo system when a second laser power is emitted from the optical pickup is obtained by arithmetic operation on the basis of the first gain adjustment value, the second gain adjustment value is set in the gain adjustment means, and a second offset adjustment value for canceling an offset which occurs in the servo system is obtained, and then, the second laser power, gain adjustment value, and offset adjustment value are stored in the storage means, and

when the first laser power is switched to the second laser power during the actual operation, the switching of the laser power and the switching from the first gain adjustment value and offset adjustment value to the second gain adjustment value and offset adjustment value are carried out simultaneously.

2. An optical disk drive as defined in Claim 1, wherein the

second gain adjustment value is in proportion to the reciprocal of the ratio of the second laser power when the first laser power is used as the reference.

3. An optical disk drive as defined in Claim 1, wherein the first laser power is a laser power at a reading level, and the second laser power is a laser power at an erasing level.

4. An optical disk drive comprising:

an optical pickup for emitting a laser to an optical disk as a recording medium, and signal-processing a reflected light from the optical disk;

a servo error signal generation means for generating a servo error signal of a focusing and tracking servo system from the reflected light;

an offset detection means for detecting an offset which occurs in the servo error signal due to defocusing or detracking of an objective lens in the optical pickup, and obtaining an offset adjustment value for canceling the offset;

an offset adjustment means for adding the offset adjustment value to the servo system to cancel the offset of the servo system which is detected by the offset detection means;

a gain adjustment means for adjusting the gain of the servo system;

a laser power switching means for changing the power of the

laser emitted from the optical pickup;

a command means for outputting an offset adjustment command, a gain adjustment command, and a laser power switching command to the offset adjustment means, the gain adjustment means, and the laser power switching means, respectively;

a storage means for holding an offset adjustment value, a gain adjustment value, and a laser power, which are to be set in the offset adjustment means, the gain adjustment means, and the laser power switching means, respectively; and

a driving means for receiving the servo error signal, and outputting a driving signal for controlling the optical pickup;

wherein a first gain adjustment value and a first offset adjustment value to be set in the servo system are stored in a first storage area provided in the storage means, when the laser power emitted from the optical pickup is a first laser power;

said optical disk drive being characterized by that, after the first gain adjustment value and offset adjustment value obtained by the adjustment operation are stored in the first storage area, the command means outputs a command for turning off the laser output from the optical pickup to the laser power switching means and, after the laser output is turned off, second to m-th (m: integer not less than 2) gain adjustment values to be set in the servo system when second to m-th laser powers are emitted from the optical pickup are obtained by arithmetic operation based on the first gain adjustment value, and the

second to m -th gain adjustment values are set in the gain adjustment means, and then, second to m -th offset adjustment values for canceling offsets that occur in the servo system are obtained, and the second to m -th laser powers, gain adjustment values, and offset adjustment values are stored in second to m -th storage areas provided in the storage means, respectively, and

 during the actual operation, when the laser power is switched from the first laser power to an n -th (n : integer not less than 2 and not larger than m) laser power among the second to m -th laser powers, the switching of the laser power and the switching of the first gain adjustment value and offset adjustment value to the n -th gain adjustment value and offset adjustment value are carried out simultaneously.

5. An optical disk drive as defined in Claim 4, wherein the second to m -th gain adjustment values are in proportion to the reciprocals of the ratios of the second to m -th laser powers when the first laser power is used as the reference.

6. An optical disk drive as defined in Claim 4, wherein the first laser power is a laser power at a reading level, and the second to m -th (m : integer not less than 2) laser powers are laser powers at erasing levels.

7. An optical disk drive comprising:

an optical pickup for emitting a laser to an optical disk as a recording medium, and signal-processing a reflected light from the optical disk;

a tracking error signal generation means for generating a tracking error signal of a tracking servo from the reflected light;

an offset detection means for detecting an offset which occurs in the tracking error signal due to detracking of an objective lens in the optical pickup or deviation of the optical axis of a photodetector, and obtaining an offset adjustment value for canceling the offset;

first and second offset adjustment means for adding two offset adjustment values to the tracking error signal to cancel the offset of the tracking error signal which is detected by the offset detection means;

a gain adjustment means for adjusting the gain of the tracking servo;

a laser power switching means for changing the power of the laser emitted from the optical pickup;

a command means for outputting an offset adjustment command, a gain adjustment command, and a laser power switching command to the first and second offset adjustment means, the gain adjustment means, and the laser power switching means, respectively;

a storage means for holding two offset adjustment values, a gain adjustment value, and a laser power, which are to be set in

the first and second offset adjustment means, the gain adjustment means, and the laser power switching means, respectively; and

a driving means for receiving the tracking error signal, and outputting a driving signal for controlling the optical pickup;

wherein the offset adjustment and gain adjustment of the tracking servo are carried out after the focusing is turned on in the state where a first laser power is set in the laser power switching means, and the first offset adjustment value, gain adjustment value, and laser power which are set by the above-described adjustments are stored as first adjustment values in a first storage area provided in the storage means;

said optical disk drive being characterized by that, after the first adjustment values obtained by the adjustment operation are stored in the first storage area, the command means outputs a command for turning off the laser output to the laser power switching means and, after the laser output is turned off, second to m -th gain adjustment values to be set in the servo system when second to m -th (m : integer not less than 2) laser powers are emitted from the optical pickup are obtained by arithmetic operation based on the first gain adjustment value, and the second to m -th gain adjustment values are set in the gain adjustment means, and then, second to m -th offset adjustment values for canceling offsets that occur in the servo system are obtained, and the second to m -th laser powers, gain adjustment values, and offset adjustment values are stored in second to m -th

storage areas provided in the storage means, respectively, and during the actual operation, when the laser power is switched from the first laser power to an n-th laser power among the second to m-th laser powers, the first offset adjustment value and the n-th offset adjustment value are set in the first offset adjustment means and the second offset adjustment means, respectively, simultaneously with the switching of the laser power from the first laser power to the n-th laser power.

8. An optical disk drive as defined in Claim 7, wherein a tracking error signal generation method employed by the tracking error signal generation means is a push-pull method.

9. An optical disk drive as defined in Claim 7, wherein the first laser power is a laser power at a reading level, and the second to m-th laser powers are laser powers at erasing levels.